

PATENT COOPERATION TREATY

From Japanese Patent Office
(INTERNATIONAL SEARCH AUTHORITY)

To: HAYASE, Kenichi HAYASE & CO. 13F, NISSAY SHIN-OSAKA Bldg., 3-4-30, Miyahara, Yodogawa-ku, Osaka-shi, Osaka 532-0003 JAPAN	<p style="text-align: center;">PCT</p> <p style="text-align: center;">WRITTEN OPINION OF THE ISA (PCT Rule 43bis)</p> <hr/> <p>Date of Mailing 08 March 2005</p>
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Applicant's or agent's file reference P36023-P0	See item 2 below for the subsequent procedure	
International application No. PCT/JP2004/016938	International filing date 15 November 2004	Priority date 28 November 2003
International Patent Classification (IPC) or national classification and IPC Int. Cl ⁷ H03D 7/00, 7/14		
Applicant Matsushita Electric Industrial Co., Ltd.		

1. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 43.2.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☒ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

OMISSION(2 and 3)

Date of completion of this opinion 15 February 2005
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Name and mailing address of the ISA/JP Japanese Patent Office	Authorized officer Telephone No.
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I . Basis of the opinion

1. This opinion has been drawn on the basis of the language of international application, unless otherwise indicated below.

OMISSION (2, 3, and 4)

TRANSLATION of related part of Form PCT/ISA/237

WRITTEN OPINION OF THE ISA

International application No.
PCT/JP2004/016938

V Reasoned statement under Rule 43.2.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims 1, 3, 9, 12, 14	YES
	Claims 2, 4, 5-8, 10, 11, 13, 15-16	NO
Inventive Step(IS)	Claims 8, 13	YES
	Claims 1-7, 9-12, 14-16	NO
Industrial Applicability (IA)	Claims 1-16	YES
	Claims NONE	NO

2. CITATIONS AND EXPLANATIONS

Reference 1: JP 04-129407 A (Alps Electric Co., Ltd.), 30 April, 1992
 Reference 2: JP 07-254821 A (NEC Corp.), 03 October, 1995
 Reference 3: JP 2001-522566 A (Maxim Integrated Products, Inc.), 13 November, 2001
 Reference 4: JP 09-069730 A (NEC Corp.), 11 March, 1997

The inventions as defined in Claims 1, 3, 9, and 12 are the same as those described in Figs. 1 to 3 of Reference 1 that is cited in the International Search Report. In addition, the invention as defined in Claim 14 is the same as that described in Fig. 2 of Reference 1 that is cited in the International Search Report.

Therefore, the inventions as defined in Claims 1, 3, 9, 12, and 14 do not involve in novelty and inventive steps, in view of Reference 1 cited in the International Search Report.

The Reference 1 cited in the International Search Report describes that "To improve distortion characteristics, a differential amplifier consisting of transistors Q5 and Q6 requires a large collector current. On the other hand, to improve noise factor characteristics of a double balanced mixer consisting of transistors Q1, Q2, Q3, and Q4, the collector current must be reduced." (Page 2, lower-left column, lines 4-9).

Further, Reference 2 cited in the International Search Report describes that transistors are connected in parallel to reduce a flowing current.

Therefore, the inventions as defined in Claims 2, 10, and 11 are obvious from References 1 and 2 cited in the International Search Report, and do not involve in inventive steps.

TRANSLATION of related part of Form PCT/ISA/237

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VI Certain documents cited

1. Certain published documents (Rule 43,2.1 and 70.10)

Application No. <u>Patent No.</u>	Publication date <u>(day/month/year)</u>	Filing date <u>(day/month/year)</u>	Priority date(valid claim) <u>(day/month/year)</u>
JP2004-104515 A [P, X]	2 April 2004 (02.04.2004)	10 September 2002 (10.09.2002)	

2. Non-written disclosures (Rule 43,2.1 and 70.9)

OMISSION

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of V.

Reference 3 cited in the International Search Report describes that a bias current supply circuit for additionally supplying a bias current only to an output load unit is provided.

Therefore, the invention as defined in Claim 4 is obvious from References 1 and 3 cited in the International Search Report, and does not involve in an inventive step.

As the mixer described in Fig. 1 of Reference 4 cited in the International Search Report is a double balanced type and the mixer described in Fig. 2 is a single balanced type, and because of their similarity in the structure, transformation of the mixer described in Figs. 1 to 3 of Reference 1 that is cited in the International Search Report into a single balanced type is obvious to a person skilled in the art.

Therefore, the inventions as defined in Claims 5 and 7 are obvious from References 1 and 4 cited in the International Search Report, and do not involve in inventive steps.

As the point that the mixer is a single balanced type is the same as in Claims 5 and 7, and the point that the transistors are connected in parallel is the same as in Claims 2, 10, and 11, the invention as defined in Claim 6 is obvious from References 1, 2, and 4 cited in the International Search Report, and does not involve in an inventive step.

None of the References cited in the International Search Report describes that a current source for additionally supplying a current only to load resistors is provided.

Therefore, the inventions as defined in Claims 8 and 13 involve inventive steps.

As replacement of a bipolar transistor by an MOS transistor is obvious to a person skilled in the art, the invention as defined in Claim 15 is obvious from Reference 1 cited in the International Search Report, and does not involve in an inventive step.

As a fact that a mixer circuit is used for a receiving system according to the direct conversion system or a receiving system according to the Low-IF system is obvious to a person skilled in the art, the invention as defined in Claim 16 is obvious from Reference 1 cited in the International Search Report, and does not involve in an inventive step.